
Replacing ISDN BRI cards

If completion of ISDN BRI troubleshooting determines that the equipment is defective, remove the defective cards and replace them with spares. The procedures in this chapter describe how to unpack replacement cards, remove and replace defective cards, verify the operation of ISDN BRI equipment, and package and ship the defective cards to an authorized repair center.

Unpacking replacement cards

Unpack and visually inspect the replacement cards by following the steps below:

Unpacking replacement cards

- 1 Inspect the shipping container for damage. Notify the distributor if the container is damaged.
- 2 Remove the unit carefully from the container. Do not puncture or tear the container; use a utility knife to open it. Save the container and the packing material for the shipment of the defective card.
- 3 Visually inspect the replacement card for obvious faults or damage. Report the damage to a Northern Telecom sales representative.
- 4 Keep cards in their antistatic bags until ready to install them. Do not stack them on top of each other.
- 5 Install the cards in the Meridian 1 module. When handling the cards, hold them by their nonconductor edges to prevent damage from static discharge.

Removing and replacing the MISP

The MISP can be removed from and inserted into the Meridian 1 modules without turning off the power to the module. This allows the system to continue processing calls on the peripheral cards not associated with the defective MISP.

Note: A clock controller is required for ISDN BRI trunk applications. If the MISP being removed is providing the clock function, the clock must be reassigned to another location. Please refer to the 553-3901-201.

Removing the MISP

- 1 Log in on the maintenance terminal or telephone and load overlay program 32 (type in **LD 32**).
- 2 Check the status of the MISP by entering **STAT c** where c is the card slot number of the MISP.

Note: Make sure the MISP is idle before proceeding with the next step to avoid interrupting active calls.

- 3 When the Type **DISL III** and press the ENTER key to disable the MISP loop, where **III** is the MISP loop number being disabled.
- 4 Unlatch the card-locking devices by squeezing the tabs and pulling the card-locking devices away from the card as shown in [Figure 13](#)
- 5 Pull the card out of the module and place it into an antistatic bag away from the work area.

Remove the clock controller if there is one, and place it in an antistatic bag away from the work area.

- 6 Hold the replacement card by the card-locking devices and insert it partially into the card guides in the module.
- 7 Pull the card-locking devices away from the card faceplate and firmly insert the card into the backplane connector. Press the card-locking devices firmly against the faceplate to latch the card inside the module, as shown in [Figure 14](#). The MISP automatically starts the self-test.

Install the clock controller if required.

- 8** Observe the red LED on the front panel during self-test. The LED is on during the test. If it flashes three times and stays on, it has passed the test. Go to step 9. If it does not flash three times and then stay on, it has failed the test. Pull the MISP partially out of the module and reinsert it firmly into the module and repeat step 8. If the problem persists, go to the previous chapter to troubleshoot the MISP or look for other common or network equipment problem causes.
- 9** At the > prompt in the LD32 program, type **ENLL III** and press the ENTER key to enable the MISP loop. If the red LED on the MISP turns off, the MISP is functioning correctly and is ready to process calls. If the LED stays on, go to the procedure “Testing the MISP status” in the “Isolating and correcting faults” chapter in this document.
- 10** Tag the defective card with a description of the problem and prepare it for shipment to the equipment supplier's repair depot.

Figure 13
Unlatching the card-locking devices on a card

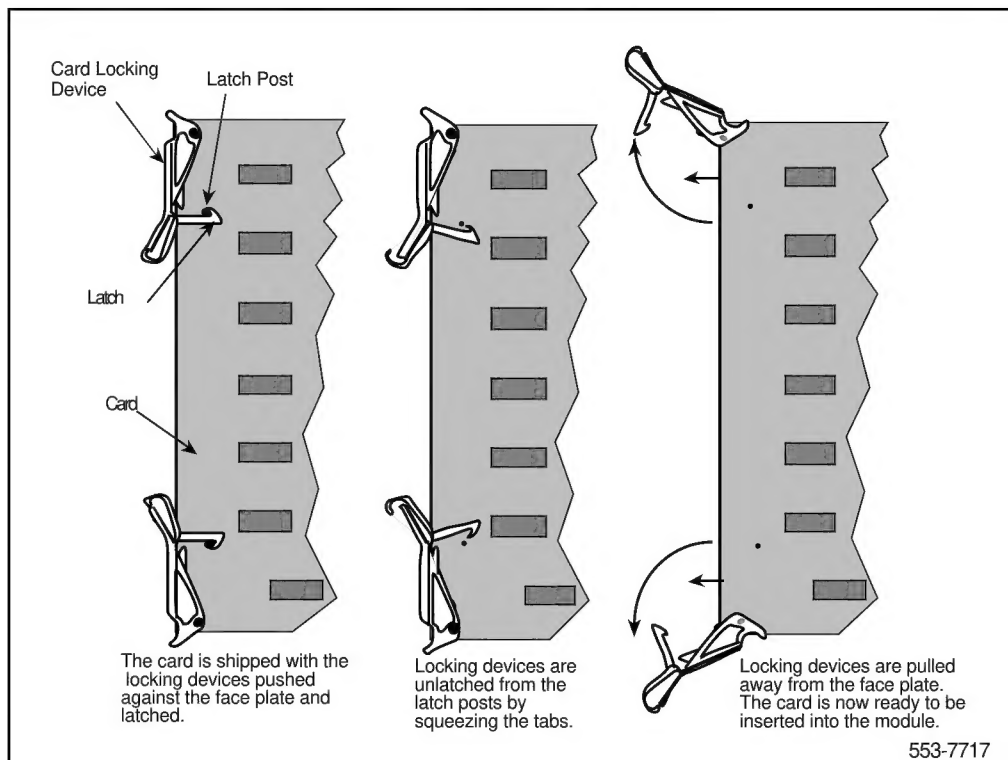
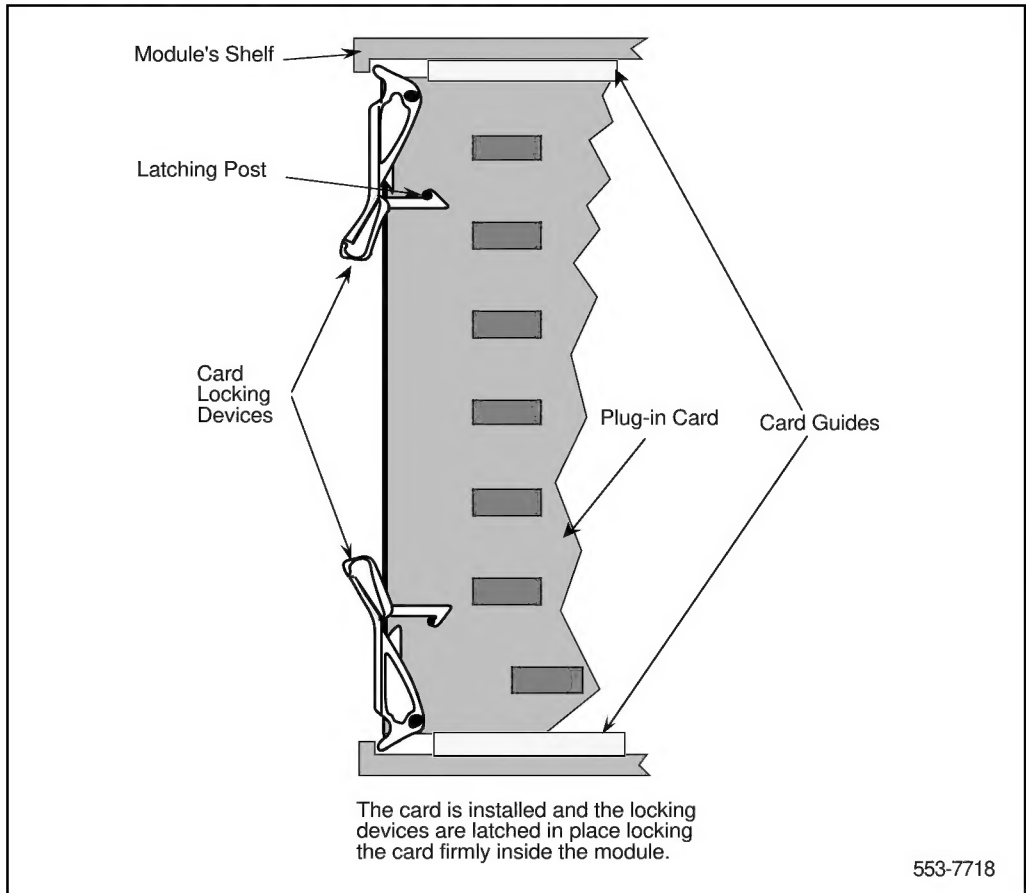


Figure 14
Latching the card-locking devices on a card



Removing and replacing the SILC, UILC or BRSC

The SILCs, UILCs and BRSCs can be removed from and inserted into the Meridian 1 modules without turning off the power to the module. This allows the system to continue processing calls on functional SILCs, UILCs and BRSCs.

Note: If an ISDN BRI trunk connected to the SILC, UILC is providing a reference clock source to system clock controller, the reference source must be reassigned to another location. Please refer to the 553-3901-201.

Removing and Replacing the SILC or UILC

- 1 Log in on the maintenance terminal or telephone and load overlay program 32 (type in **LD 32**).

Note: Make sure the MISP is idle before proceeding with the next step to avoid interrupting active calls.

- 2 Type **DISC I s c** and press the ENTER key to disable the SILC or UILC, where **I** is the MISP network loop number, **s** is the shelf (module) number, and **c** is the card slot number in the module.
To disable the BRSC, type **DISC III s c** and press the ENTER key, where **III** is the superloop number, **s** is the shelf (module) number, and **c** is the card slot number in the module.
- 3 Unlatch the card-locking devices by squeezing the tabs and pulling the devices away from the card as shown in [Figure 13](#).
- 4 Pull the card out of the module and place it in an antistatic bag away from the work area.
- 5 Hold the replacement card by the card-locking devices and insert it partially into the card guides in the module.
- 6 Pull the card-locking devices away from the faceplate on the card and insert the card firmly into the backplane connector. Firmly press the card-locking devices against the faceplate to latch the card in the module, as shown in [Figure 14](#). The card automatically starts the self-test.

- 7 Observe the red LED on the front panel during the self-test. The LED is on during the test. If it flashes three times, the card passes the test. Go to step 9. If the red LED does not flash three times and then stay on, the card fails the test. Pull the card partially out of the module, reinsert it firmly, and repeat step 8. If the problem persists, go to the previous chapter to troubleshoot the card or look for other problem causes.
- 8 At the > prompt in the LD32 program, type **ENLC I s c** and press the ENTER key to enable the card. If you are enabling the BRSC, type **ENCL III s c** and press ENTER. If the red LED on the card turns off, it is functioning correctly and is ready to process calls; otherwise, go to the procedure “Checking the SILC and UILC status” or “Checking the BRSC status” in “Isolating and correcting faults” in this document.
- 9 Tag the defective card with a description of the problem and prepare it for shipment to the equipment supplier’s repair center.

Verifying operation

After replacing faulty cards with the spares and enabling them, some basic functional tests should be performed to verify that the replacement card has solved the problem.

To verify the operation of an SILC, UILC or a BRSC card, perform the following steps:

Verifying the operation of an SILC, UILC or a BRSC card

- 1 Place an outgoing voice or data call on an ISDN BRI terminal or trunk connected to a previously faulty card or DSL to verify the outgoing transmission and signaling channels.
- 2 Place an outgoing voice or data call on an ISDN BRI terminal to the ISDN BRI terminal or trunk in step 1 to verify the incoming transmission and signaling channels.
- 3 Repeat these two steps for other previously faulty cards and DSLs.

To verify the operation of an MISP, follow the following steps:

Verifying the operation of an MISP

- 1 Place an outgoing voice or data call on an ISDN BRI terminal connected to a DSL associated with a previously faulty MISP to verify its ability to process the signaling information received on D-channels.
- 2 Disconnect the call after determining that the connection was successful.

Reinstalling covers

After completing the verification and determining that the system is operating correctly, perform the following steps.

Reinstalling covers

- 1 Reinstall covers on the system modules.
- 2 Terminate the session with Meridian 1 by logging out on the maintenance terminal. Type LOGO at the > prompt and press the ENTER key.

Packing and shipping defective cards

To ship the defective ISDN BRI card to an authorized repair center, perform the following steps:

Packing and shipping defective cards

- 1** Tag the defective card with the description of the problem.
- 2** Package the defective card for shipment using the packing material from the replacement card. Place the card in an antistatic bag, then into the box, and securely close the box with tape.
- 3** Obtain the shipping and cost information from Northern Telecom and mail the package to an authorized repair center.

Testing and troubleshooting ISDN BRI terminals

Verifying a new M5317T terminal installation

Verifying user operation

Any problems found during this phase should be corrected before turning equipment over to the customer. Refer to the "Troubleshooting" chapter.

- 1 Examine loop length.
- 2 If under-carpet cabling is used, evaluate the cables for loss, impedance, crosstalk, and propagation delay.
- 3 Examine all telephone connections.
- 4 Set up a communication path to another M5317.
- 5 Go through some call routines, using the enabled features. (Refer to the M5317 Voice Features User Guide for procedures to establish and answer telephone calls.)
- 6 Verify that the display is showing the appropriate responses.

Troubleshooting the M5317T

Trouble conditions may be reported by the telephone user (customer report), by way of automatic routine tests, or during installation procedures.

Isolating switch problems

- 1 Run the LD32 diagnostic program for the Meridian 1 switch.
- 2 Check for error and location codes in the diagnostic output.
- 3 If the codes indicate a faulty component, replace it. Refer to the "Replacing ISDN BRI cards" section in this document.
- 4 Run the diagnostic programs again to confirm that the error and location codes have been cleared.

Clearing error codes

Perform the following steps if the telephone displays error codes after initialization. After each step, check the display. If an error code persists, go to the next step.

- 1 If the static X.25 TEIs in the telephone and the network do not match, datafill the telephone TEIs manually.
- 2 If the SPIDs in the telephone and the network do not match, correct the telephone SPIDs.
- 3 Confirm that a terminating resistor is present in the loop.
- 4 Perform a loop-back test with the suspect telephone connected to an external shorting jack.
- 5 Substitute a different telephone, datafilling it with the same information as the suspect telephone.
- 6 Replace or repair any defective wiring between the telephone and the network termination or line card.
- 7 Confirm that non-reversing cables are used.
- 8 Replace the telephone and repeat the installation process.

Restoring dial tone

If there is no dial tone or if you cannot make a telephone call, follow these procedures. Check for dial tone and try to make a call after each step.

- 1** Check and re-insert any loose Teladapt connectors.
- 2** Wiggle the line cord or handset cord while listening for sounds from the handset. If you hear crackling or ticking sounds, replace the cords.
- 3** Check the teladapt socket for the handset or try another handset.
- 4** Re-run any defective wiring between the line card, distribution panel, and telephone.
- 5** Check the switch software to confirm the correct telephone assignment and voice channel operation in the network.
- 6** Replace the telephone.

Isolating faulty keys

Refer to the M5317T Installation Guide for procedures to follow if you suspect faulty key operation or if the display is behaving strangely.

Verifying a new M5209T terminal installation

Procedures are provided for the following tests:

- Running a self-test
- Running a panel test
- Making a test voice call
- Making a test data call (applies to the M5209TDp and M5209TDcp models only)
- Assigning the test display language (M5209TDcp models only)

Running a self-test

WARNING

If you have made changes to SPIDs or TEIs, wait 20 seconds for the set to update its memory before continuing.

- 1 Unplug the RJ45 line cord from the jack, wait five seconds, then plug it in. The set automatically does a self-test on power up.
- 2 Check the display for the following message:

SELF TEST PASSED

If this message appears, the self-test was completed successfully. If the self-test failed, the display shows the following message:

***code:* SELF TEST FAILED**

V:TWait P:TWait C:TWait

Where ***code:*** refers to a specific code number. Write down the code number(s) and refer to the “Troubleshooting displayed error messages” section of the M5209T Installation Guide.

Running a panel test

- 1 Press the Hold and Rls keys simultaneously until the following main menu is displayed:

MAIN MENU
CONFIG

- 2 Press #. The following prompt is displayed:

ENTER PASSWORD

- 3 Dial 4736 (ISDN) and press #. The following message is displayed:

CONFIGURATION MENU
TEI

- 4 Press * until the following option is displayed:

CONFIGURATION MENU
KEY TEST

- 5 Press # to begin the key test.

The M5209T tests the display and indicators by flashing a checkerboard pattern on the display, and by turning on the half-diamonds one at a time.

After the display test, the following message appears:

DEPRESS ALL KEYS

Press the following keys; as you do, check that each key is displayed as it is pressed.

0-9 (dial pad keys)

*

#

volume up/volume down

Hold

Rls

When all keys have been tested, the following should be displayed:

0123456789*#UDHR

- 6 Press each feature/line key.

As you press each key, a diamond appears on the associated feature/line indicator. When you press the last indicator, a diamond does not appear. Instead, the following message is displayed:

CONFIGURATION MENU
EXIT

- 7 Note any problems that you encountered during the test, and refer to the Troubleshooting section.
- 8 Exit the test by pressing Rls.

Making a test voice call

- 1 Make a voice call using a standard test DN. Note any problems that you encountered during the test, and refer to the Troubleshooting section.

Making a test data call

Note: Skip this test if the installed set is an M5209T (voice only set).

- 1 If you have been trained in making and troubleshooting data call, refer to the appropriate set manuals to make the test data call. If you are not familiar with data call procedures, contact the customer representative and have him make a data call for you.

Assigning the test display language

Note: This test applies to the M5209TDcp only.

- 1 Press the Hold and Rls keys simultaneously until the following main menu is displayed:

MAIN MENU
CONFIG

- 2 Press * until the following option is displayed:

MAIN MENU
LANGUAGE

- 3 Press #. The following message is displayed:

LANGUAGE
ENGLISH

- 4 Press * to select the desired display language.
- 5 Press #. The following message is displayed:

MAIN MENU
EXIT

Troubleshooting the M5209T

Trouble conditions may be reported by the telephone user (customer report), by way of automatic routine tests, or during installation procedures. The following are general troubleshooting procedures to follow when problems are found with the M5209T; for more detailed information on troubleshooting the M5209T, refer to the M5209T Installation Guide.

Note: You should bring the following spare replacement parts to the installation site to be tested:

- installed set model
- handset
- handset cord
- RJ45 line cord
- RS-232C interface cable

Power and cable connection problems

When no response is received from the M5209T, the cable and power connections should first be checked before proceeding with any other troubleshooting sequence.

Check the cable connections and power supply, by ensuring that:

- 1 The RJ45 line cord is properly connected to the wall jack or Terminator Resistor (TR) box.
- 2 If used, the RS-232C interface cable is properly connected to both the DTE port and the M5209 data port.
- 3 The handset cord is properly connected to both the handset and the handset jack underneath the set.
- 4 The cable from the wall jack or TR box, to the NT1, is properly connected.
- 5 The U-loop cable and the NT1 is properly connected.
- 6 The S-loop cable and the NT1 is properly connected

- 7** The NT1 is functioning properly.

Whether the NT1 is a stand-alone or rack-mount model, both types are functioning properly when the LED status indicators appear as summarized below:

Status Indicator	LED light
Power	On
S/T	OFF
U-sync	OFF
Test	OFF

If the NT1 indicators are not as shown above, it is not ready for use with the M5209; contact your supervisor for direction.

Once you have checked the cable connections and power supply, and the M5209 is still not responding:

- 8** Unplug the RJ45 line cord from the wall jack or TR box for five seconds, then plug it back in and perform a power reset on the M5209.
- 9** If problems still exist, try another M5209T set, using the existing cables. If this set works, the problem is with the original set; it should be replaced.

If the replacement M5209T does not work, replace the existing cables with your spare cables; repeat step 8.

If problems persist, contact your supervisor.

Problems with the set components

Problems with the set components may include:

- the keys are not responding, or responding improperly;
 - the feature key indicators are not functional
 - the display is not functional
 - the handset has no audio, or the audio is distorted
 - the speaker has no audio, or the audio is distorted
- 1 Check the cable connections using the procedures described in the “Power and cable connection problems” section. For handset problems, try another handset cord or another handset.
 - 2 If cables are not the source of the problem, run a panel test as described in the “Verifying a new M5209T terminal installation” chapter.

If the panel test fails, replace the set.

Troubleshooting displayed error messages

When a self test is performed as described in the “Verifying a new M5209T terminal installation” chapter, and it fails, a code number is displayed to indicate the type of error that is at hand. Refer to the “Troubleshooting displayed error messages” section of the M5209T Installation Guide for a complete description of these codes, and the steps required to fix the problem situation.